What is claimed is:

1.   A cable modem system comprising:

a data networking engine that performs data networking functions; and

a cable modem engine that performs all other cable modem functions; the cable modem engine being completely partitioned from the data networking engine.

2.   A cable modem system as claimed in claim 1, wherein all DOCSIS functions are localized in the cable modem engine.

3.   A cable modem system as claimed in claim 2, wherein VoIP functionality is embedded in the cable modem engine.

4.   A cable modem system as claimed in claim 1, and further comprising an advanced crypto engine that performs all crypto functions.

5.   A cable modem system as claimed in claim 1, wherein the cable modem engine comprises:

a DOCSIS PHY layer;

a DOCSIS MAC processor; and

a DOCSIS controller.

6.   A cable modem system as claimed in claim 5, wherein the DOCSIS PHY layer comprises a hardware transmitter and receiver.

7.   A cable modem system as claimed in claim 5, wherein the DOCSIS MAC processor processes downstream PDU packets and forwards the processed packets directly to the data networking engine without the involvement of the DOCSIS controller in order to boost downstream throughput.

8.   A cable modem system as claimed in claim 5, wherein all VoIP functionality is implemented in the DOCSIS controller.

9.   A cable modem system as claimed in claim 8, wherein the VoIP functionality is in conformance with the PacketCable specification.

10.   A cable modem system as claimed in claim 5, wherein the data networking engine is responsible for all data networking processing including advanced multi-port briding/routing with NAT/firewall and VPN, and home networking applications.

11.   A cable modem system as claimed in claim 10, wherein the data networking engine comprises the entire embedded portal services functionality of the CableHome specification.

12.   A cable modem architecture comprising:

a cable modem engine comprising:

a DOCSIS PHY layer comprising a transmitter and receiver;

a DOCSIS MAC processor that implements real-time critical MAC

functions for both upstream and downstream communications; and

a DOCSIS controller implementing VoIP functionality; and

a data networking engine implementing all data networking processing and home

networking applications, wherein the data networking engine is completely decoupled

from the cable modem engine.

13.   A cable modem architecture as claimed in claim 12, wherein the DOCSIS

controller provides VoIP functionality in accordance with the PacketCable specification,

and wherein the data networking engine provides the embedded portal services

functionality of the CableHome specification, wherein the CableHome functionality is

provided by the data networking engine is completely decoupled from the PacketCable

and DOCSIS functionality provided by the cable modem engine.

14.   A cable modem architecture as claimed in claim 13, wherein the DOCSIS

MAC processor is an ARM9TDMI-based RISC processor, and wherein the DOCSIS

controller is an ARM940-based RISC processor.

15. A method for providing a flexible and partitioned cable modem gateway comprising:

providing data and home networking functionality in a data networking engine;

providing DOCSIS and VoIP functionality in a cable modem engine; and

partitioning the data networking engine from the cable modem engine so that the data and home networking functionality is completely decoupled from the DOCSIS and VoIP functionality.